

Barriers to Mammography Screening: How to Overcome Them

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Abstract

Background: Screening mammography is an established intervention that leads to early breast cancer detection and reduced mortality. The Lebanese Ministry of Health has initiated yearly awareness campaigns and provided free mammography in multiple centers around the country.

Methods: The study took place in two major areas of Lebanon - Beirut and South Lebanon. This cross-sectional survey aimed to assess knowledge about breast cancer screening and screening behaviors in the Lebanese population. The primary outcome of the study was to assess the reasons that prevented women from performing screening mammography based on our categories of questions: lack of knowledge about breast cancer, lack of access to screening facilities, failure of primary care physician to encourage screening behavior, and other reasons.

Results: The major barriers to seek screening that had statistically significant *P*-values, in order of prevalence, included: lack of knowledge about breast cancer, followed by social reasons and lack of access.

Conclusion: Given the prevalence of breast cancer in our population, it is important to understand the pitfalls that we experience in promoting awareness. Our study is the first study to reach out to the community to assess perceived barriers against screening and provide solutions for such barriers.

Keywords: Breast Cancer, Mammography screening, Campaign

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Introduction

Screening mammography is an established intervention that leads to early breast cancer detection and reduced mortality. The age at which

screening mammography should commence remains controversial. Most countries recommend starting this screening modality between the ages of 40 and 50 years.

Table 1. Baseline characteristics of the participants.

Characteristics	N	%
Marital status		
Single	30	12.3
Married	179	73.4
Divorced	17	7.0
Widowed	18	7.4
Missing data	6	2.4
Place of residence		
Beirut	125	51.2
Mount Lebanon	19	7.2
North Lebanon	24	9.8
South Lebanon	71	29.1
Bekaa	5	2
Missing data	6	2.4
Level of education		
None	21	8.6
Elementary	80	32.7
High school	80	32.7
University	64	26.1
Missing data	35	14
Job		
No	163	65.5
Yes	86	34.5
Missing data	1	0.99
Family income per month (US \$)		
<500	70	31.4
500-1500	12	54.7
1500-3500	23	10.3
>3500	8	3.6
Missing data	27	10.8
Age, years		
(mean±SE)	52.27 ±11.32	

The Lebanese guidelines recommend performing a yearly screening mammogram on all women age 40 and above.¹ Based on this recommendation, the Lebanese Ministry of Health has initiated yearly awareness campaigns and provides free mammography screenings in multiple centers around the country. Despite aggressive campaigning, the percentage of eligible individuals who actually perform a screening mammogram remains low. This is estimated to be between 12% and 16%,¹ which is much lower than western countries where this number is close to 70%.²

This study aimed to better understand the reasons that stop Lebanese women from performing this potentially life saving intervention.

Table 2. Barriers to mammography screening.

	N	%
Lack of knowledge		
No	57	23.2
Yes	189	76.8
Social causes		
No	102	40.8
Yes	148	59.2
Lack of access		
No	139	55.6
Yes	111	44.4
Negligence by primary physician		
No	158	63.2
Yes	92	36.8
Other reasons		
No	205	82
Yes	45	18
Neglect		
No	153	61.2
Yes	97	38.8

Materials and Methods

A total of 400 women were invited to participate in this cross-sectional survey to assess knowledge about breast cancer screening and screening behaviors. The study was conducted over a one-year period (2012-2013) and included women of Lebanese origin, above the age of 40 years, those with no prior history of breast cancer, and who did not have a screening mammography in the past year. The study took place in two major areas in Lebanon - Beirut and South Lebanon. Relatively few subjects were from the North and Mount Lebanon area. The survey was facilitated by research assistants who obtained oral informed consent and distributed the questionnaires. The questionnaires were self-administered and completed anonymously. The questionnaire assessed barriers to mammography screening, knowledge about breast cancer, socio-demographic characteristics and medical history (Appendix A).

The primary outcome of the study was to assess the reasons that prevented women from performing screening mammography. This was evaluated by targeting four categories of questions: lack of knowledge about breast cancer, lack of access to screening facilities, failure of primary care physician to encourage screening behavior,

Table 3. Distribution of reasons within lack of knowledge category.

Reasons:	Distribution (n)	Distribution (%)
I don't know anything about the mammography test.	45	7.4
It didn't come to my mind at all that I should do a mammography.	100	16.5
I didn't know that I have to do a mammography every year.	73	12.1
I don't think that mammography can detect breast cancer.	25	4.1
I don't have to do mammography because I don't have any symptoms or problems with my breasts.	114	18.8
I don't have to do a mammography because I examine my breasts on my own.	63	10.4
I don't have to do a mammography because my doctor examines my breasts.	22	3.6
I don't have to do a mammography because I don't have any family history of breast cancer.	49	8.1
I don't have to do a mammography because it's not recommended for people in my age group.	17	2.8
I believe that I shouldn't be worried about breast cancer if I am in good health.	66	10.9
I believe that you can't treat nor cure cancer (cancer=death).	32	5.3

and other reasons (Appendix B). Each of the four variables was broken down into questions where volunteers checked the related boxes. An answer of yes to 1 or more of the questions under each category reflected a deficiency in the said category. Secondary outcomes assessed the effect of socio-demographic characteristics and medical history on breast cancer screening attitudes.

Statistical analysis

SPSS version 20.0 was used to enter and analyze data. Descriptive analysis was performed for socio-demographic characteristics, the medical history of the participants, their knowledge about breast cancer and the barriers that prevented the mammography. Percentages were shown for qualitative variables, while means and standard deviation were given for quantitative variables. The Fisher exact test was used for comparison between categorical variables. A *P*-value of 0.05 was considered significant and 95% confidence intervals (CI).

Results

A total of 250 women met the inclusion criteria and were approved to participate in the survey. A total of 150 women did not meet the inclusion criteria: 20 women were of non-Lebanese origin, 40 women had a mammography within the preceding year, 10 had a history of breast cancer

and 80 women refused to participate. Table 1 summarizes the subjects' demographics. Essentially, the subjects mean age was 52 years, 73.4% percent were married women, 51.2% were residents of Beirut (capital city of Lebanon), 8.6% received no education, 65.5% were unemployed and 54.7% of the volunteers had a mean monthly income of 500-1500 dollars.

Our results revealed that the major barrier to seek screening was lack of knowledge about breast cancer (Table 2). A total of 76.8% of volunteers answered yes to at least one of the questions in the "lack of knowledge" category. We assessed the most frequently checked question within the lack of knowledge category (Table 3), where it was apparent that the main barrier against performing a mammography was the misconception that the absence of breast symptoms precluded the need for a mammography (18.8%). Other common reasons were that women were oblivious to the fact that screening should be performed on a yearly basis (12.1%), in addition to a failure to grasp the necessity of screening, as 16.5% of our volunteers stated that the thought to perform a mammography did not occur to them at all. "Social barriers" ranked second in terms of barriers to mammography screening (59.2%). The two most common reasons within this category were fear of breast cancer and therefore a desire not to know if they have the disease

Table 4. Distribution of reasons within social barriers category.

Reasons:	Distribution (n)	Distribution (%)
I do not like to visit doctors.	59	15.5
I do not like and refuse to be examined by a male doctor, and I prefer a female doctor.	46	12.0
I feel embarrassed, which is why I do not like to do a mammography.	36	9.4
I do not do mammography because of religious reasons.	7	1.8
I do not do mammography because someone in my family does not want me to.	2	0.5
I am afraid of the pain/discomfort during the mammography.	34	9.0
I am afraid of being exposed to the radiation from the mammography.	22	5.8
I am afraid of the anxiety I feel while waiting for the mammography result.	71	18.6
I am afraid of the results and I do not want to know if I have any problems in my breasts.	74	19.3
I am afraid of discovering any problems in my breasts because I have a family history of breast cancer.	31	8.1

(19.3%), in addition to fear of anxiety while waiting for the results (18.6%) as seen in Table 4. In the “other reasons” category, “neglect” was the most commonly provided answer (38.8%).

We wanted to assess the distribution of barriers to mammography screening by demography. We divided the areas into the city of Beirut, which is the most urban area compared to three other sectors of Lebanon: Mount Lebanon, North and South Lebanon. The latter are considered rural areas compared to Beirut. Women from Beirut (27.9%), Mount Lebanon (27.8%), and the North (29.2%) scored the highest in the lack of knowledge category as a barrier to screening; the *P*-value, however, was borderline ($P=0.05$; Table 5). In terms of social barriers, women from the city (Beirut) most frequently acknowledged social reasons as a barrier to screening (86%), followed by women from South of Lebanon as a rural area (32%), with a highly significant *P*-value (0.01).

Women who identified with reasons reflecting lack of access were mostly from Beirut (63%) followed by South of Lebanon (26%) with a significant *P*-value of 0.04 (Table 5).

A significant portion of volunteers had a family history of cancer from which 25.4% had a family history of breast cancer and another 22.5% reported family history of other cancers (Table 6). This, however, did not translate into personal screening habits. Table 7 lists knowledge about breast cancer and screening, where 88.4% agreed to the fact that there is a screening tool for breast cancer, 90.6% believed that early detection can increase survival, 81.1% said that breast cancer can be inherited, and 58.1% agreed that the absence of a breast mass precludes the presence of breast cancer.

Discussion

Results from our sample size have revealed that

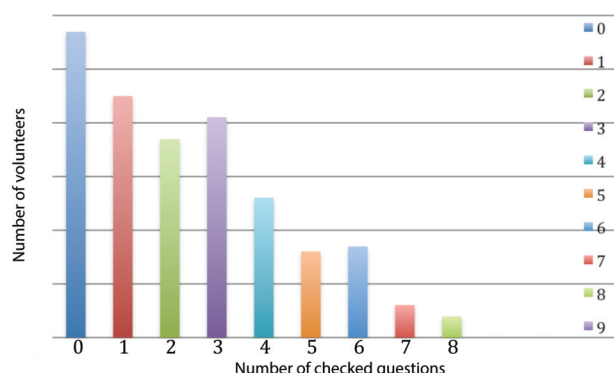
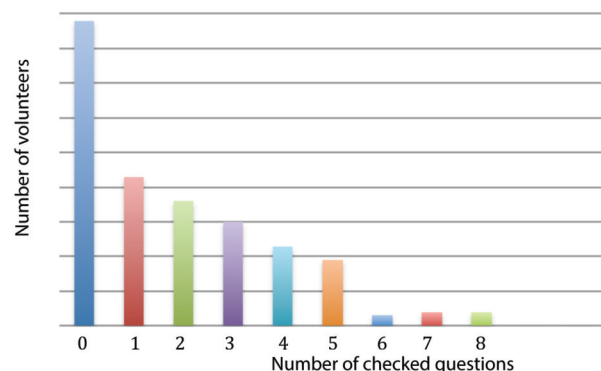
**Figure 1.** Distribution of the severity of lack of knowledge.**Figure 2.** Distribution of the severity of social causes.

Table 5. Distribution of barriers according to place of residence.

Lack of knowledge	Absent n(%)	Present n(%)	P-value
Beirut	34 (27.9)	88 (72.1)	0.05
Mount Lebanon	5 (27.8)	13 (72.2)	
North	7 (29.2)	17 (70.8)	
Bekaa	1 (20)	4 (80)	
South	8 (11.3)	63 (88.7)	
Social barriers			
Beirut	39 (31.2)	86 (68.8)	0.01
Mount Lebanon	10 (52.6)	9(47.4)	
North	11 (45.8)	13 (54.2)	
Bekaa	1 (20)	4 (80)	
South	39 (54.9)	32 (45.1)	
Lack of access			
Beirut	62 (49.6)	63 (50.4)	0.04
Mount Lebanon	10 (52.6)	9 (47.4)	
North	18 (75)	6 (25)	
Bekaa	1 (20)	4 (80)	
South	45 (63.4)	26 (36.6)	
Physician related barriers			
Beirut	74 (59.2)	51 (40.8)	0.07
Mount Lebanon	13 (68.4)	6 (31.6)	
North	21(87.5)	3 (12.5)	
Bekaa	3 (60)	2 (40)	
South	42 (59.2)	29(40.8)	
Neglect			
Beirut	81 (64.8)	44 (35.2)	0.1
Mount Lebanon	7 (36.8)	12(63.2)	
North	16 (66.7)	8 (33.3)	
Bekaa	2 (40)	3 (60)	
South	45(63.4)	26 (36.6)	

despite aggressive campaigning efforts, there remains significant room for improvement in terms of all the assessed barriers (Table 5). The pattern of distribution between urban and rural areas was statistically significant in terms of social barriers ($P=0.01$), lack of access ($P=0.04$), and was equivocally significant for lack of knowledge ($P=0.05$). This pattern of distribution was unexpected as Beirut has received more intense campaigning and mass education compared to other Lebanese districts and considered to be the center of primary care facilities and major hospitals in the country. Furthermore, Beirut, as a city, has more educated people that are less bound to social and cultural norms compared to the rural areas. Nonetheless, the results from our survey show that awareness campaigns have not achieved their goal in adequately relaying information on breast cancer and screening, as lack

of knowledge was the most commonly recorded barrier (76.8%). This has reflected a lack of insight in our society despite the fact that the majority of our participants were educated. We wanted to assess the profoundness of the lack of knowledge in our sample population. In Figure 1, the majority

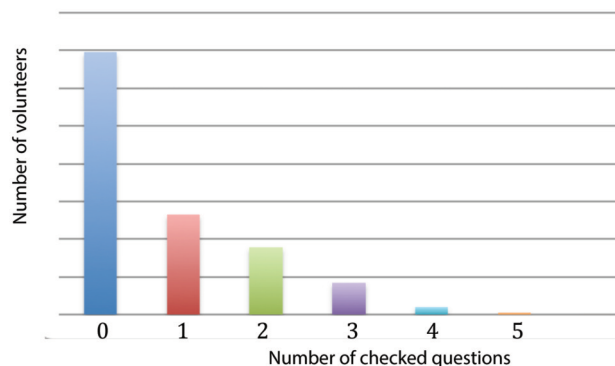


Figure 3. Distribution of the severity of lack of access.

Table 6. Medical history of the participants.

Medical history	N	%
Previous medical history		
None	127	50.2
Hypertension	6	2.4
Dyslipidemia	1	0.4
CAD	12	4.7
Cancer	54	21.3
Diabetes	12	4.7
Multiple diseases	41	16.2
Personal history of breast disease		
No	231	92.8
Yes	18	7.2
Family history of breast cancer		
No	185	74.6
Yes	63	25.4
Family history of cancer (other than breast cancer)		
None	196	77.5
Aunt	19	7.5
Sister	18	7.1
Mother	10	4.0
Cousin	4	1.6
Uncle	1	0.4
Father	2	0.8
Daughter	2	0.8
Brother	1	0.4
Family history		
None	184	72.7
Hypertension	22	8.7
Dyslipidemia	5	2.0
CAD	3	1.2
Cancer	7	2.8
Diabetes	9	3.6
Multiple diseases	23	9.1

of women show a lack of knowledge pertaining to one question, whereas a minority have displayed a profound lack of knowledge in their answers to eight questions. This indicated that our campaigns have achieved a basic level of awareness. However, we need to tailor future efforts in order for education to become a primary intent. Campaigns should focus on rectifying information deficits with the most frequently recorded being the mistaken view that absence of breast symptoms precludes the need for screening (Table 3). Women from our study were unaware of the necessity of screening (16.5%), nor were they conscious of the need for yearly screening (12.1%). Adib et al. reported that Lebanese women were less likely to perform repeat mammograms after first time

Table 7. Knowledge about breast cancer and breast cancer screening.

	N	%
There is screening for breast cancer.		
No	28	11.6
Yes	214	88.4
Early detection can increase survival.		
No	23	9.4
Yes	222	90.6
At what age does mammography screening start?		
30	65	27.2
40	135	56.5
50	11	4.6
60	6	2.5
Only when there is a doubt.	22	9.2
Do you perform breast self-exams?		
No	110	44.2
Yes	131	52.6
Sometimes	8	3.2
Does your health care provider perform clinical breast exams?		
No	161	72.9
Yes	60	27.1
Breast cancer can be inherited.		
No	45	18.9
Yes	193	81.1
If there is no mass there is no breast cancer.		
No	98	41.9
Yes	136	58.1

screening.³ Campaigning, therefore, should stress the importance of screening as a necessity rather than a choice and emphasize the significance of adherence to yearly mammograms. It was important to note the impact that society has played on providing women with accurate facts about breast cancer and screening. Lebanon is no doubt a country defined by social, religious and cultural constructs that determine the society's way of life. It comes as no surprise that social reasons play a significant role in impeding breast cancer screening as they came second to lack of knowledge as an obstacle to performing mammography (59.2%).

The term cancer is heavily associated with negative stigma in the Lebanese community,⁴ this intimidation drives women to shy away from screening. In Table 4 women have most frequently alleged that they did not want to know if they have cancer, nor did they want to experience anxiety

while waiting for results - therefore, they avoided screening. The experience of breast cancer is heavily rooted in the manner by which society illustrates it⁵ and consequently has repercussions on screening behavior. Similar results have been seen with an immigrant Iranian population in California. The study showed that personal beliefs, which were a product of culture, still played a negative impact on breast cancer screening attitudes, despite the fact that these women showed no deficits in knowledge about breast cancer and screening.⁶ Moreover, it seemed that a good portion of Lebanese women did not prioritize their health. A substantial portion of women spontaneously reported “neglect” as a barrier to screening (38.8%). The same observation was noticed in immigrants in Denmark that included those of Arab origins and showed that while knowledge was not an issue to screen for breast cancer, these women did not prioritize it.⁷ In Figure 2 we attempted to investigate the prevalence of social factors in our community and observed that the majority of women demonstrated concerns in accordance to one or two factors. A very small minority stated that 8 out of 13 factors under “social causes” were of concern. This has shown that while social factors play a role as barriers to screening they do not exert a profound effect on our society, or at least one that can be rectified through proper campaigning. Future campaigning efforts need to focus on two corner stones; first, tackle women’s poor perception about health priority and second, work on rectifying socially prevalent misconceptions about breast cancer and screening. It is important to emphasize that early screening and detection translates into higher survival and cure rates; this can abate the fear of breast cancer that is well established in the Lebanese society. It is worthwhile to attempt to integrate these campaigns into the younger population’s education by targeting school and university students. In this manner we can target the problem at the source, thereby raising a new generation equipped with true data free of social stigma and misconceptions.

Lack of access was third as a factor against

breast cancer screening with a significant *P*-value of 0.04. Figure 3 demonstrates the effect that lack of access plays on the Lebanese society. We showed that the majority of our sample size (53) checked one out of the seven questions under that category. None of our population found that all seven factors played a role in their decision not to perform mammography. The majority of women seemed to be concerned about a few factors that could be easily abated through awareness. This has shown that the effort we put into improving the Lebanese mammography screening rates through proper campaigning can be profound.

Physicians play a vital role in this quandary. There is no data in Lebanon on attitudes of both hospital and non-hospital based physicians towards screening. Women are more likely to practice screening when encouraged by physicians.⁸ Furthermore, they are more receptive to instructions when information is tailored to their convictions.^{9,10} Given the cultural nature of the Lebanese society, this approach can be a driving force to promote proper screening behaviors. Borrayo et al. have studied such an approach in Latino women and found that when these women perceived respect towards their cultural norms by their health providers they were more likely to follow screening counseling.¹¹ There have been no studies in Lebanon that assess the adherence of physicians to recommend yearly mammograms. This is an important factor because Lebanese physicians are often pressed for time when it comes to the patient-physician encounter. Bird et al. have provided a solution to the problem at hand; interestingly they employed lay health workers into the equation.¹² Awareness sessions when made available by lay health care workers were shown to significantly impact screening behavior.¹² This effort can be easily tailored into breast cancer screening awareness sessions and impact women of different socio-demographic characteristics. Physicians as well as campaigners can also make use of the ever-growing social media. The medical community can take advantage of this public podium to spread

awareness. Use of the Internet, emails and sms-texting systems have been suggested as inexpensive modalities to promote adherence to screening.¹³ Thackery et al. assessed the popularity of tweeting about breast cancer during awareness months and found a heavy interest by users.¹⁴ This phenomenon has so far been one-sided by being restricted to users.¹⁴ Campaigners could reach back to the community to tackle a variety of needs whether it be the provision of general information or answering specific questions that users could pose. Social media, as a more popular, accessible source to the public than medical sources, is more likely to impact screening behavior. The importance of employing non-medical sources into efforts to promote health related behavior has been validated by Hornik et al.¹⁵ The study showed that routine exposure to health related information through non-medical sources, referred to as scanning, was more likely to impact health related behaviors.¹⁵ Pertaining to breast cancer, Hornik et al. showed that through scanning women were more likely to adhere to yearly mammograms.¹⁵

Our study showed that while Lebanon is actively involved in promoting breast cancer screening, there is still room for improvement. Given the prevalence of breast cancer in our population, it is important to understand the pitfalls that we experience in promoting awareness. We have highlighted the profound effect of social and cultural norms in promoting misconceptions about both breast cancer and screening behaviors. The study also emphasized the role of physicians to actively promote mammograms while being sensitive and respectful towards culture. Additionally we introduced social media as a new tool to campaigns. This was the first study to reach out to the community to assess perceived barriers against screening and provide solutions for such barriers, which was a strong point. Limitations of the study included the fact that the sample was not representative of the Lebanese population as it was conducted in two areas and the questionnaire was not based on a validated model.

Modifications tailored to the Lebanese Campaign to spread awareness about breast cancer screening can serve as a model to other developing countries still lacking in the domain. Simple, inexpensive yet effective measures can be undertaken to positively impact the fight against breast cancer.

Conflict of interest

No conflict of interest is declared.

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